

CLAIMS

The invention claimed is:

1. A method of treating a component of a deposition apparatus, the component comprising a composition having a first hardness, the method comprising exposing a surface of the component to bead blasting with bead-blasting media comprising particles having a second hardness greater than or equal to the first hardness, the particles consisting essentially of one or both of metal alloy and elemental metal.
2. The method of claim 1 wherein the component surface consists essentially of tantalum, and wherein the particles comprise one or more metallic components compatible with the tantalum.
3. The method of claim 1 wherein the component surface consists essentially of tantalum, and wherein the particles comprise one or more of titanium, molybdenum, tantalum, tungsten and cobalt.
4. The method of claim 1 wherein the component is a sputtering target consisting essentially of tantalum, and wherein the particles consist essentially of one or more of titanium, molybdenum, tantalum, tungsten and cobalt.
5. The method of claim 1 wherein the component is a sputtering target consisting essentially of tantalum, wherein the particles are a first set of particles comprised by the bead-blasting media, wherein the bead-blasting media comprises a second set of particles different from the first set of particles, wherein the first set of particles consist essentially of tungsten, the second set of particles consist essentially of sodium bicarbonate, and the volume ratio of the first set of particles to the second set of particles in the bead-blasting media is about 1:10.
6. The method of claim 1 further comprising:
forming a pattern of projections along the surface of the component; and
bending the projections.
7. The method of claim 6 wherein the component surface consists essentially of tantalum, and wherein the particles comprise one or more of titanium,

molybdenum, tantalum, tungsten and cobalt

8. The method of claim 6 wherein the bead blasting occurs before the forming of the pattern of projections.

9. The method of claim 6 wherein the bead blasting occurs after the forming of the pattern of projections and before the bending of the projections.

10. The method of claim 6 wherein the bead blasting occurs after the bending of the projections.

11. The method of claim 1 wherein the particles are a first set of particles comprised by the bead-blasting media, and wherein the bead-blasting media comprises a second set of particles different from the first set of particles, the second set of particles being soluble in aqueous solution.

12. The method of claim 11 wherein a volume:volume ratio of the first set of particles to the second set of particles within the bead-blasting media is less than or equal to about 1:3.

13. The method of claim 11 wherein a volume:volume ratio of the first set of particles to the second set of particles within the bead-blasting media is less than or equal to about 1:3 and greater than or equal to about 1:10.

14. The method of claim 11 wherein the second set of particles comprise one or more salts selected from the group consisting of alkali halide salts and ammonium halide salts.

15. The method of claim 11 wherein the second set of particles comprise one or more salts selected from the group consisting of metal hydroxides.

16. The method of claim 11 wherein the second set of particles comprise one or more salts selected from the group consisting of halide salts comprising elements selected from groups 1A and 2A of the periodic table.

17. The method of claim 1 wherein the particles are a first set of particles comprised by the bead-blasting media, and wherein the bead-blasting media comprises

a second set of particles different from the first set of particles, the second set of particles being soluble in an organic solution.

18. The method of claim 17 wherein the second set of particles comprises one or more organometallic materials.

19. A method of forming a target/backing plate construction, comprising:
providing a backing plate comprising a first composition;
providing a target comprising a second composition different from the first composition;

providing an insert having a third composition different from the first and second compositions;

bonding the target, backing plate and insert into a configuration in which the insert is between at least a portion of the target and the backing plate; the configuration having a surface which extends along a portion of the target and a portion of the insert; and

forming a particle-trapping region along said surface, the particle-trapping region comprising a pattern of curved projections which extend along the portion of the insert and along the portion of the target, the curved projections forming cavities, at least some of the cavities opening laterally along the target/backing plate construction.

20. The method of claim 19 wherein the forming the particle-trapping region occurs after the bonding and comprises:

forming a pattern of projections along the surface;

bending the projections; and

exposing the projections to bead blasting to form microstructures on the projections.

21. The method of claim 19 wherein the bead blasting utilizes a media comprising particles having a hardness greater than or equal to a hardness of the second composition, the particles consisting essentially of one or both of metal alloy and elemental metal.

22. The method of claim 21 wherein the particles are a first set of particles comprised by the bead-blasting media, and wherein the bead-blasting media comprises a second set of particles different from the first set of particles, the second set of

particles being soluble in aqueous solution or organic solution.

23. The method of claim 19 wherein at least some of the particle-trapping region is formed before the bonding.

24. The method of claim 19 wherein the bonding comprises:
 inserting the insert within the backing plate and bonding the insert to the backing plate; and
 bonding the target to the insert after the insert is bonded to the backing plate.

25. The method of claim 19 wherein the second composition comprises tantalum.

26. The method of claim 19 wherein the second composition consists essentially of tantalum.

27. The method of claim 19 wherein the second composition consists of tantalum.

28. The method of claim 19 wherein the first composition comprises copper; the second composition comprises tantalum; and the third composition comprises titanium.

29. The method of claim 19 wherein the first composition comprises copper; the second composition consists essentially of tantalum; and the third composition consists essentially of titanium.

30. The method of claim 19 wherein the first composition comprises copper; the second composition consists of tantalum; and the third composition consists of titanium.

31. The method of claim 19 wherein the second composition comprises tantalum, and the third composition comprises one or more of aluminum, tantalum and titanium.

32. The method of claim 19 wherein the target has a bonding surface

proximate the backing plate, and wherein an entirety of said bonding surface is in contact with the insert.

33. The method of claim 19 wherein the target has a bonding surface proximate the backing plate, and wherein only a portion of said bonding surface is in contact with the insert.

34. The method of claim 19 wherein the insert is a solid geometric shape of the third composition.

35. The method of claim 19 wherein the insert is a hollow geometric shape of the third composition.

36. The method of claim 19 wherein the insert is a solid circle of the third composition.

37. The method of claim 19 wherein the insert is an annular ring of the third composition.

38. A target/backing plate construction, comprising:
a backing plate comprising a first composition;
a target comprising a second composition different from the first composition;
an insert between at least a portion of the target and the backing plate, the insert having a third composition different from the first and second compositions;
the target/backing plate construction comprising a particle-trapping region extending along a portion of the target and along a portion of the insert, the particle-trapping region comprising a pattern of curved projections which extends along the portion of the insert and along the portion of the target, the curved projections forming cavities, at least some of the cavities opening laterally along the target/backing plate construction.

39. The construction of claim 38 wherein the second composition comprises tantalum.

40. The construction of claim 39 wherein the third composition comprises titanium.

41. The construction of claim 38 wherein the second composition consists essentially of tantalum.

42. The construction of claim 41 wherein the third composition comprises titanium.

43. The construction of claim 38 wherein the second composition consists of tantalum.

44. The construction of claim 43 wherein the third composition comprises titanium.

45. The construction of claim 38 wherein the first composition comprises copper; the second composition comprises tantalum; and the third composition comprises titanium.

46. The construction of claim 38 wherein the first composition comprises copper; the second composition consists essentially of tantalum; and the third composition consists essentially of titanium.

47. The construction of claim 38 wherein the first composition comprises copper; the second composition consists of tantalum; and the third composition consists of titanium.

48. The construction of claim 38 wherein the second composition comprises tantalum, and the third composition comprises one or more of aluminum, tantalum and titanium.

49. The construction of claim 38 wherein the target has a bonding surface proximate the backing plate, and wherein an entirety of said bonding surface is in contact with the insert.

50. The construction of claim 38 wherein the target has a bonding surface proximate the backing plate, and wherein only a portion of said bonding surface is in contact with the insert.

51. The construction of claim 38 wherein the insert is a solid geometric shape

of the third composition.

52. The construction of claim 38 wherein the insert is a hollow geometric shape of the third composition.

53. The construction of claim 38 wherein the insert is a solid circle of the third composition.

54. The construction of claim 38 wherein the insert is a solid circle of the third composition and is inset within the backing plate.

55. The construction of claim 38 wherein the insert is an annular ring of the third composition.

56. The construction of claim 38 wherein the insert is an annular ring of the third composition and is inset within the backing plate.